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one cluster on a clay bank. Dr. Wainio this time called the material *Cladonia mitrula*. This statement is submitted primarily to show that the species is difficult to distinguish and that the Iowa material is not certain, and in no sense to cast reproach on the work of any other lichenist. It is only those of very limited experience in taxonomic work, or who have very poor powers of observation, who suppose that a really good worker may not sometimes make different diagnosis of material that is intermediate between two species, the difference being due rarely to incomplete consideration of every diagnostic character, and no doubt more often to the fact that material from the same Cladonia cluster may often show a considerable amount of variation.

Material from Battle Lake and Leaf Hills, in Minnesota, collected by the present writer, is like the Iowa material, which is in turn doubtful. Henry Willey reported the species in his "New Bedford Lichens," but Dr. Wainio seems not to have known of this material. Dr. Wainio cites a single American specimen in his Monograph. This is cited doubtfully from Carolina. Thus there is room for doubt as to whether this species has really been found in America. The plant occurs on soil, especially clay, and is known in Europe and Asia.

Grinnell, Iowa.

MOUNTING MOSSES—SOME HINTS.

J. Franklin Collins.

In the September, 1903, issue of this journal Mr. Chamberlain described the method which was employed a few years ago to fasten moss envelopes to herbarium sheets in the Brown University Herbarium. It may be of interest to readers of The Bryologist to learn of the method which has superseded it. The latter method has been used more than two years in the University Herbarium, as well as in my own private one. Gummed wafers are utilized instead of pins. The particular wafers which we use are made of a half-inch circle of white paper, well gummed on both sides. They may be obtained for a few cents a thousand from almost any stationer. To use them to the best advantage a single wafer is graped by the edge, with slender pointed forceps, and moistened on both sides. It is then thrust between the envelope and mounting paper, the former having been placed in the proper position on the latter before the wafer is moistened. A firm finger-pressure for one or two seconds over the wafer is sufficient to cause it to adhere securely. The forceps points are withdrawn as soon as the pressure with the finger is applied. Unless the envelope is a large one a single wafer is generally sufficient.

In case the envelope has to be transferred to another sheet it is instantly removed by one sweep of a paper knife, or other blunt-edged instrument, beneath the envelope. The wafer usually splits, leaving part on the sheet and part on the envelope. This slight disfigurement of the sheet, which is often soon covered by another envelope, may be regarded by some as an objection to the use of the wafers. This disfigurement only occurs, however, when

an envelope has been removed, and even then is not much greater than that caused by several pin holes and the accompanying wrinkles in the paper. To the writer the only real argument against the use of the wafer lies in the fact that when an attached envelope is grasped by the edges and lifted away from the paper (a condition which never ought to occur, perhaps, in a carefully handled herbarium) the wafered envelope is—as is shown by tests—much more easily detached than the pinned one; the ratio of energy required to detach it being 1:6. To offset this, when an attempt is made to detach an envelope by pulling it along the surface of the sheet without lifting it, the wafered one necessitates more than twice the energy required by the pinned one (7:3). The advantage is also most decidedly with the wafered envelope (10-15:1) when a twisting strain is applied.

Some of the obvious advantages in using wafers—when compared with pins—are as follows: The envelope does not have to be opened when it is being fastened to the sheet, nor during its removal; the wafered envelope is more quickly and easily fastened, and its removal is even more quickly accomplished; the wafers cost considerably less than the pins; neither paper nor envelope is perforated; the back of the sheet is smooth, with no pin shanks to rub specimens beneath. Although the pin shanks rarely harm specimens beneath, the *danger of their doing so exists nevertheless.*

In a moss herbarium which is to be constantly consulted there are obvious advantages in having a portion of each specimen mounted on the herbarium sheet, outside the envelope. Much time, which would otherwise be utilized in opening and closing envelopes, is thus saved. This is really quite an item when one's time is all too limited, and a hand-lens examination of several or many specimens becomes necessary or desirable. The writer's method of mounting such specimens is not essentially different from that in common use for mounting seed-plants in most of the large herbaria. Liquid glue is brushed in a thin layer over a plate of glass. For mosses this glass need not necessarily be larger than 6 x 8 or 8 x 10 inches. Into this film of glue the specimen is pressed until the glue touches the essential portions of the under surface of the specimen. The latter is now lifted with forceps and laid on the mounting sheet in the position desired, and finally a suitable light pressure applied until the glue sets. A few words of caution to those who have never used this method for mounting mosses may be helpful. The commercial liquid glue should be diluted more or less, as experience dictates, with either water or vinegar—about equal parts of glue and vinegar is the proportion commonly used by the writer. It must be borne in mind that water and vinegar moisten the moss and often cause more or less of a change from the typical dry state in such parts as come in contact with either fluid. Consequently, care should be taken to allow only the lower surface of the specimen to touch the glue-covered plate. It is almost equally important not to allow the specimen to remain in contact with the glue longer than required to touch the desired parts, as otherwise there is danger that the glue will creep or filter through to the upper surface of the specimen—not only moistening that surface but often leaving unsightly films or spots. This is a simple

and efficient method of mounting *most* mosses, especially such as have been somewhat flattened while drying under slight pressnre. At certain other times it may be more advantageous to apply the glue directly to the back of the specimen.

Many bryologists have been exceedingly annoyed by the disfiguring particles of sand or soil which rattle or rub out from the matted stems and rhizoids of certain mosses, when mounted on paper. This annoyance is especially pronounced in plants which grew on sandy or clayey soil, or in such plants as *Bruchia*, and others of similar habitat, where it is desirable to retain, with the plant in the herbarium, a block of clayey substatum. Fortunately, there is a simple method of mitigating this evil and, in most cases, of entirely overcoming it. After the specimen is mounted in the ordinary way apply a few drops of diluted white shellac to the parts which are expected to prove troublesome in this respect. Care should be taken to apply the shellac to only one side of the substratum (not to the specimen) or an unsightly shiny spot *may* be evident when the solution dries. The writer has on his work table a small (1 oz.) reagent bottle with a rubber-topped dropping tube. This bottle is about half full of a mixture of shellac (1 part) and 95 per cent. alcohol (about 3 parts) which is used for the purpose mentioned. If, after drying, a thin film of shellac is obvious on the substratum or specimen, it is probably due to the fact that the shellac was not sufficiently diluted, or else too much of it was used. The moral is obvious. In most cases dissections will be made from specimens left in the envelope. Sometimes, however, it may become necessary to dissect specimens which have been treated with shellac. The preliminary application of a few drops of alcohol, or even a rinsing in that fluid, is then advisable. Providence, Rhode Island.

A LIST OF HEPATICS

Collected in the Vicinity of Little Moose Lake, Adirondack League Club Tract, Herkimer Co., New York.

By Caroline Coventry Haynes.

Marchantiaceae

Conocephalum conicum (L.) Dumort.
Marchantia polymorpha L.

Metzgeriaceae

Riccardia latifrons (Lindb.) Lindb.
" *sinuata* (Dicks.) Trevis
Metzgeria congugata Lindb.
Pellia epiphylla (L.) Corda

Jungermanniaceae

Bazzania triangularis (Schleich.) Lindb.
" *trilobata* (L.) S. F. Gray
Blepharostoma trichophyllum (L.) Dumort.
Cephalozia bicuspidata (L.) Dumort.
" *curvifolia* (Dicks.) Dumort.